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**Task: 11**

**Section: BSAI-4B**

**Subject: PAI Lab**

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**1. LangChain:**

* **What it is**: A Python (and JS) framework to build applications with Large Language Models (LLMs).
* **Purpose**: Helps developers connect LLMs with external data (APIs, files, databases), tools (retrievers, agents), and chains of prompts.
* **Example use**: Building a chatbot that can read PDFs, search Wikipedia, and answer based on that.

**2. RAG (Retrieval-Augmented Generation):**

* **What it is**: A technique that combines information retrieval with text generation.
* **Purpose**: Retrieves relevant data (e.g., from a database or documents) and feeds it to an LLM to generate more accurate and grounded responses.
* **Example use**: Chatbot answering questions based on your uploaded notes or internal company documents.

**3. LLMs (Large Language Models):**

* **What it is**: AI models trained on massive text data to understand and generate human-like text.
* **Examples**: GPT-4, BERT, LLaMA, Claude.
* **Usage**: Translation, summarization, Q&A, content creation, coding, etc.

**4. FAISS (Facebook AI Similarity Search):**

* **What it is**: A library to perform fast and efficient similarity search on vectors.
* **Purpose**: Finds similar embeddings (vector representations of text/images).
* **Use in RAG**: To search relevant chunks of data from a vector database.

**5. Vector:**

* **What it is**: A numerical representation of data (like text) in multi-dimensional space.
* **Purpose**: Used to measure similarity between items (e.g., cosine similarity).
* **Example**: The sentence “I love AI” is converted into a vector like [0.3, 0.8, -0.2, ...].

**6. VectorDB (Vector Database):**

* **What it is**: A database optimized to store and search vectors efficiently.
* **Examples**: FAISS, Pinecone, Chroma, Weaviate.
* **Use**: In RAG systems to quickly retrieve relevant information for LLMs.

**7. Generative AI:**

* **What it is**: A broad category of AI that generates new content (text, images, music, code).
* **Includes**: LLMs (like GPT), image generators (like DALL·E), audio models, and more.
* **Example**: ChatGPT generating a poem or Midjourney generating artwork.

**8. GANs (Generative Adversarial Networks):**

* **What it is**: A type of generative AI involving two neural networks—**Generator** and **Discriminator**.
* **Purpose**: The Generator creates fake data, the Discriminator tries to detect fakes, and both improve over time.
* **Use cases**: Deepfake creation, art generation, synthetic image datasets.

**Quick Comparison Table:**

| **Concept** |  | **Category/Type** |  |  | **Main Use/Role** |
| --- | --- | --- | --- | --- | --- |
| **LangChain** |  | Framework |  |  | Building apps using LLMs |
| **RAG** |  | Architecture |  |  | Enhancing LLM output using external data |
| **LLMs** |  | AI Model |  |  | Text generation and understanding |
| **FAISS** |  | Library/Tool |  |  | Fast vector similarity search |
| **Vector** |  | Data format |  |  | Numerical data representation (e.g., text) |
| **VectorDB** |  | Database type |  |  | Storing and retrieving vectors |
| **Generative AI** |  | AI Category |  |  | Creating new content |
| **GANs** |  | Model type |  |  | Generating realistic images/data |